

Siro KURITA*: Chromosome studies on South American
pteridophytes (2) Chromosome number of
*Ophioglossum crotalophoroides***

栗田子郎*: 南米産シダ植物の染色体の研究 (2)
Ophioglossum crotalophoroides の染色体数

Since the publication of Walker's cytological survey of Jamaican ferns (Walker 1966), new data on chromosome numbers of neotropical pteridophytes have been accumulated by many authors (vid. Kurita 1986). In this paper, I report the gametic chromosome number of a tropical American *Ophioglossum* species, *O. crotalophoroides* Walter.

Materials and methods Materials were collected at Corani (2000 m alt.), 70 km north of Cochabamba, Bolivia on Oct. 20th in 1983, in the grass at the roadside. A few liveing specimens were brought to Japan with permission by the Ministry of Agriculture of Republica de Bolivia, and cultivated in the pots at the experimental garden of Chiba University. To observe meiotic division, very young fertile spikes (0.5–1.0 cm in length) were fixed in 1:3 acetic acid-alcohol for 24 hours or longer. The spike thus fixed was macerated and squashed after the addition of a drop of aceto-orcein. Permanent preparations were made by usual dry ice method.

Observation At the first meiotic division ca. 285 bivalent chromosomes were counted in many spore mother cells (Figs. 1, 2). The size of bivalents by the time of diakinesis ranged from 1 μm to 4 μm in the figured cell. Usually one large and one rather small nucleoli were observed in a spore mother cell. The size of the former ranged from 6 μm to 9 μm , and that of the latter was about 3 μm in diameter. On the other hand each nucleus of the plasmodium included one to four well-stained and condensed nucleoli of which diameter was within 4 μm .

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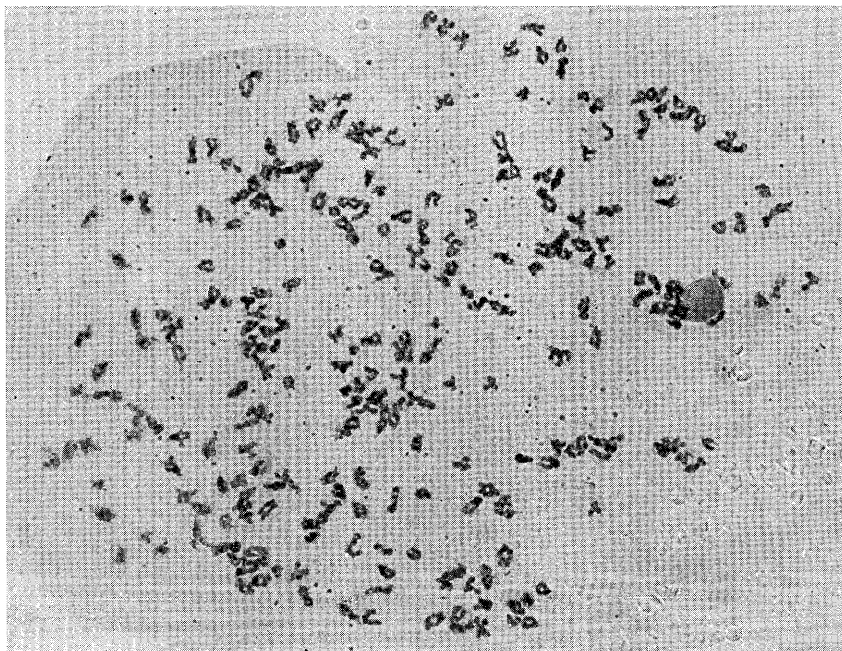


Fig. 1. Photomicrograph of a squashed spore mother cell of *O. crotalophoroides*, showing ca. 285 bivalent chromosomes and two nucleoli.

Discussion This is the first report on the chromosome number of *O. crotalophoroides*. By this time, the chromosome numbers of about twenty species of the genus *Ophioglossum* have been studied by many authors. It has been revealed that the greater part of *Ophioglossum* species have very high chromosome numbers in spite of their small plant size and simple organization. Moreover, in some species, many cytotypes have been reported. For example, the gametic chromosome numbers of 150–160, ca. 172, 240, 247–251, ca. 250, 250–260, 340–346, 385–390, 410, 410–420, 465–475, 480, 515–520, and ca. 570 were reported in *O. vulgatum*, and 110–120, ca. 120, ca. 205, ca. 382, ca. 392, 436, 451, 480, 495, 564, 566, 570, 572, 630, ca. 640, and 720 in *O. reticulatum*.

The basic chromosome number of this genus is obscure as yet, though some authors such as Chiarugi (1960), Löve et al. (1977), and Kurita & Nishida (1965) supposed it to be $X=15$ in connection with the basic number of the family Botrychiaceae. The presence of a multiple series of haploid chromosome number,

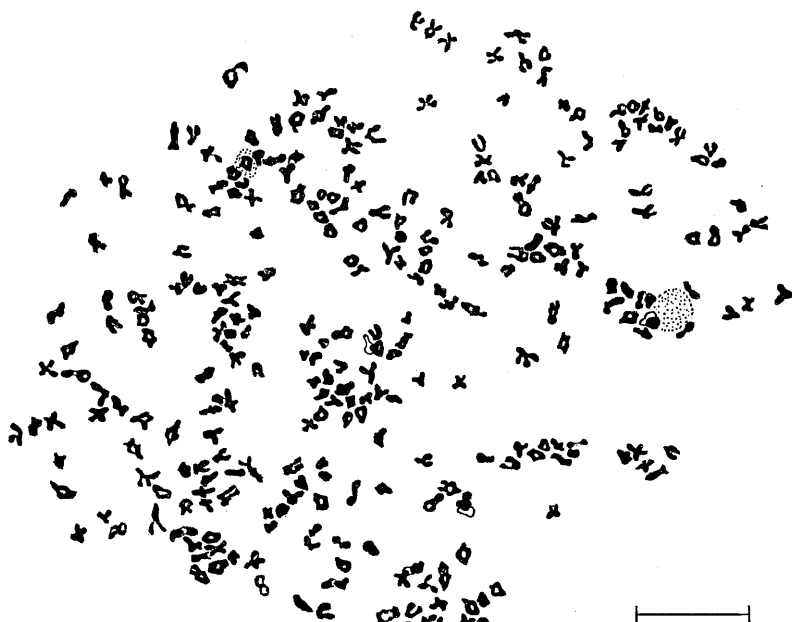


Fig. 2. Explanatory diagram for Fig. 1. Bar indicates 20 μm .

120—240—360—480, suggests to us that the gametic number of 120 may be a basic number of the genus, though there are many species and/or cytotypes having the chromosome number which deviates from this polyploid series. These deviantances may be simple aneuploids which have been originated from the cytotypes based on $X=120$, or may be compound polyploids based on other lower basic chromosome numbers in any case. It may be said in this connection that Goswami & Khandelwal (1980) reported a phenomenon of chromosomal elimination in the natural populations of *Ophioglossum* species, and an electrophoretic isozyme study on a related genus *Botrychium* by Soltis & Soltis (1986) is positive in denying the presence of lower basic number such as $X=15$ which was once considered to be a common basic chromosome number of Ophioglossales (Chiarugi 1960). These findings suggest to us the possibility of aneuploid origin of most cytotypes.

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ボリビア産の *Ophioglossum crotalophoroides* (アンデスタマハナヤスリ) の減数分裂の第一分裂肥厚期において約 285 個の二価染色体が数えられた。これは、この種の染色体数に関する最初の報告である。ca. 285 という数は ハナヤスリ属では初めて観察されたものであるが、これが $n=240$ または $n=360$ に由来する異数性起源のものか、それとも $x=15$ のような低い基本数に由来する倍数性起源のものかは不明である。

□菱山忠三郎：山野草植物図鑑 455 pp. 1987. 主婦の友社，東京。¥1200. 84×148 mm という小型で、著者の手によるカラー写真が 430 頁にわたる。新たに手頃な値段のきれいな図鑑がほしいという人にはおすすめする。その一方、カラー図鑑はもはや無数に出版されているので、一般論として注文もつけない。説明を思い切って方向転換できないだろうか。環境庁の「身近な生き物調査」で、紋切り型の解説が素人には何の役にも立たないことがわかった。もっと直観的に「コレダ」とわからせるような説明を工夫してほしい。学名を自分の判断で入れてもらいたい。小型な割に 17 mm の厚みがあるにしては紙が厚いので、本を開いて置けないから使いにくい。出版社が使い方を知らないためだろう。著者は使う身になって、出版社の「きれいなものを出せばよい」という偏見を正してほしい。

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